

CLAIMS

We claim the following:

1. A cell culture system comprising a mixture of mature neuronal cells and cells isolated from a ciliary body.
2. The cell culture system according to claim 1 wherein the mature neuronal cells comprise mature retinal neuronal cells.
3. The cell culture system according to claim 2 wherein the mature retinal neuronal cells are selected from the group consisting of bipolar cells, horizontal cells, amacrine cells, ganglion cells, and photoreceptor cells.
4. A retinal cell culture system comprising a mixture of mature retinal neuronal cells and cells isolated from a ciliary body.
5. The retinal cell culture system according to claim 4 wherein the mature retinal neuronal cells are selected from the group consisting of a bipolar cell, a horizontal cell, an amacrine cell, a ganglion cell, and a photoreceptor.
6. A retinal cell culture system comprising a mixture of mature retinal neuronal cells and cells isolated from a ciliary body, wherein the mature retinal neuronal cells are selected from the group consisting of bipolar cells, horizontal cells, amacrine cells, ganglion cells, and photoreceptor cells.
7. A retinal cell culture system comprising a mixture of (i) mature retinal neuronal cells; (ii) cells isolated from a ciliary body; and (iii) embryonic retinal cells.

8. The cell culture system of claim 7 wherein the embryonic retinal cells comprise retinal stem cells.

9. The cell culture system of claim 7 wherein the embryonic retinal cells comprise embryonic retinal progenitor cells.

10. The cell culture system of claim 7 wherein the mature retinal neuronal cells are selected from the group consisting of bipolar cells, horizontal cells, amacrine cells, ganglion cells, and photoreceptor cells.

11. A method for producing a retinal cell culture system comprising co-culturing a mature retinal neuronal cell and a cell isolated from a ciliary body.

12. A method for enhancing survival of a mature retinal neuronal cell *in vitro* comprising co-culturing a mature retinal neuronal cell and a cell isolated from a ciliary body.

13. The method according to either claim 11 or claim 12 comprising co-culturing (i) a mature retinal neuronal cell; (ii) a cell isolated from a ciliary body; and (iii) an embryonic retinal cell.

14. The method according to claim 13 wherein the embryonic retinal cell is selected from the group consisting of a retinal stem cell and an embryonic retinal progenitor cell.

15. A method for identifying a bioactive agent that is capable of enhancing survival of a neuronal cell, comprising (i) contacting a candidate agent with a cell culture system according to any one of claims 1-10, under conditions and for a time sufficient to permit interaction between a neuronal cell of the cell culture system and the candidate agent; and (ii) comparing survival of a neuronal cell of the cell culture system in the presence of the candidate agent with survival of a neuronal cell of the cell culture system in the absence of the candidate

agent, and therefrom identifying a bioactive agent that is capable of enhancing survival of the neuronal cell.

16. A method for identifying a bioactive agent that is capable of inhibiting neurodegeneration of a neuronal cell comprising (i) contacting a bioactive agent with a cell culture system according to any one of claims 1-10, under conditions and for a time sufficient to permit interaction between a neuronal cell of the cell culture system and the candidate agent; and (ii) comparing structure of a neuronal cell of the cell culture system in the presence of the bioactive agent with structure of a neuronal cell of the cell culture system in the absence of the bioactive agent, and therefrom identifying a bioactive agent that is capable of inhibiting neurodegeneration of the neuronal cell.

17. A method for identifying a bioactive agent that is capable of treating a retinal disease comprising contacting a bioactive agent with a cell culture system according to any one of claims 1-10, under conditions and for a time sufficient to permit interaction between a neuronal cell of the cell culture system and the candidate agent; and (ii) comparing neurodegeneration of a neuronal cell of the cell culture system in the presence of the bioactive agent with neurodegeneration of a neuronal cell of the cell culture system in the absence of the bioactive agent, and therefrom identifying a bioactive agent that is capable of treating a retinal disease.

18. The method according to any one of claims 15-17, wherein the neuronal cell is a retinal neuronal cell.

19. The method of claim 17 wherein the retinal disease is selected from the group consisting of macular degeneration, glaucoma, diabetic retinopathy, retinal detachment, retinal blood vessel occlusion, retinitis pigmentosa, and a retinal disorder associated with Alzheimer's disease.

20. A method for treating a retinal disease comprising introducing isolated retinal stem cells into retinal tissue of a subject in need thereof.

21. The method of claim 20 wherein the retinal disease is selected from the group consisting of macular degeneration, glaucoma, diabetic retinopathy, retinal detachment, retinal blood vessel occlusion, retinitis pigmentosa, and a retinal disorder associated with Alzheimer's disease.